Alfred I duPont Hospital for Children
NCC – Wilmington

2nd Year Resident PICU Rotation

Snap Shot Review
And
Preparation
For
July 2002- June 2003

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Director, PICU Resident Rotation

Department of Pediatric Anesthesiology and Critical Care

Alfred I duPont Hospital for Children of the Nemours Foundation
NCC – Wilmington

May 2002
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Introduction

Nemours’ Pediatric Critical Care physicians supported by PICU Pharmacists, PICU Nurses and Respiratory Therapists and Reference Librarian provide a 4 week PICU rotation for

- Thomas Jefferson University Pediatric 2nd year residents
- Thomas Jefferson University Emergency Medicine 2nd year residents
- Christiana Care Health System Emergency Medicine 2nd year residents
- Christiana Care Health System 2nd and 3rd year Medicine-Pediatric and Internal Medicine-Emergency Medicine residents
- Alfred I duPont Hospital for Children Emergency Medicine 1st year Fellows
- 4th year medical students from various programs.
- Pediatric Critical Care Nurse Practitioner Students

We aim to introduce individual residents to the art of pediatric critical care in an environment where we balance

- Residents’ expectations for a productive educational experience
- Resident’s PICU service obligations
- Resident’s time commitment to concurrent outside-of PICU program expectations
- Pediatric Graduate Medical Education and SCCM viewpoints on time committed to resident PICU exposure
- Critical care attendings’ clinical, administrative, research and other educational responsibilities
- Consistent bedside care of the critically ill child
- Healthcare economics.

Our present PICU goals, curriculum and future plans reflect 11 years of ongoing development based on recommendations and observations from

- SCCM Guidelines for Resident Physician Training in Critical Care Medicine
- American Medical Association, Graduate Medical Education Guidelines for PICU Resident Rotations
- SCCM Pediatric ICU Resident Education Committee
- General Guidelines for Resident Training in Critical Care Medicine
- The Future of Pediatric Education II
- Postgraduate Education for Pediatricians
- Interactions with the Thomas Jefferson University Pediatric Residency Program
- CQI via 1994 nursing and 1994 through 2002 resident questionnaires as well as surveys of practicing physicians who participated in our PICU rotation since 1994
Pediatric Intensive Care Resident Rotation
Goals and Objectives

Goal 1: Understand how to resuscitate and stabilize the critically ill child in the PICU setting.

Objectives:
- Explain and perform steps in resuscitation and stabilization, particularly airway management and resuscitative pharmacology.
- Describe the common causes of acute deterioration in the previously stable PICU patient.
- Function appropriately in codes and resuscitations as part of the PICU team.

Goal 2: Understand how to evaluate and manage infants, children, and adolescents with certain diagnoses (reasonably expected of general pediatricians) commonly encountered in the PICU setting, as well as indications for transfer to a pediatric intensive care physician.

Objectives:
- Learn the pathophysiology, differential diagnosis, assessment and management of pediatric:
  - Acute respiratory failure
  - Hemodynamic instability
  - Sepsis
  - Acute neurologic insults
  - Acute electrolyte and endocrine disorder
  - Acute renal failure
  - Coagulation disorders
  - Overdoses and poisonings
  - Trauma
  - Burns
  - Multiple Organ System Dysfunction

Goal 3: Understand the application of physiologic monitoring and special technology treatment in the PICU setting.

Objectives:
- Learn the indications and techniques of:
  - CVP monitoring
  - Intracranial monitoring
  - Invasive blood pressure monitoring
  - Analgesia
  - Parenteral nutrition
  - Oxygen administration
  - Acute ventilator management
  - BiPaP, CPAP

Goal 4: Develop case management skills for complex multi-problem patients under high stress situations, under the supervision of an intensivist, using principles of decision-making and problem solving and understanding one's own limits.

Objectives:
- Develop/maintain detailed problem lists with accurate prioritization.
- Coordinate with multiple consultants involved in the care of the patient.
- Recognize the limits of one's knowledge, skills, and tolerance for stress; ask for help as needed.
**Goal 5:** Understand how to provide comprehensive and supportive care to the PICU patients/families.

**Objectives:**
- Communicate effectively in verbal and written form with fellow residents, attendings, consultants, referring physicians, nursing staff, social workers, auxiliary health care professionals, and discharge planners.
- Recognize and evaluate the psycho-social needs of acutely ill children and their families, during both the immediate illness and recovery.
- Demonstrate respect, sensitivity, and skill in dealing with death and dying with the child, family, and other health care professionals.
- Interface appropriately with established plans of care for chronically ill children.

**Goal 6:** Become familiar with ethical and medical-legal considerations in the care of critically ill children.

**Objectives:**
- Discuss concepts of futility, withdrawal, and withholding of care.
- Define brain death and describe criteria for organ donation.
- Describe hospital policy on "Do Not Attempt Resuscitation" orders.
- Understand indications for ethics committee consultation.

**Goal 7:** Become familiar with pediatric critical care research

**Objectives:**
- Exposure to clinical research protocols, critical care resuscitation animal lab, case reports
- Exposure to Continuous Quality Improvement in the PICU

**Goal 8:** Incorporate Evidence-Based Clinical Practice techniques into daily PICU patient care.

**Objectives:**
- Ask clinically-focused questions that pertain to PICU patient care
- Search the literature for appropriate articles that address the clinically focused questions
- Evaluate the validity, results, and clinical applicability of the articles
- Present the information in the form of a Critically Appraised Topic to the PICU team
## Resident Goals Prior to PICU Resident Rotation at Alfred I duPont Hospital for Children

<table>
<thead>
<tr>
<th></th>
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<tr>
<td>Procedures</td>
<td>22</td>
<td>25</td>
<td>30</td>
<td>26</td>
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<tr>
<td>Run a Code</td>
<td>15</td>
<td>14</td>
<td>20</td>
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<tr>
<td>Recognize and stabilize critically ill child</td>
<td>13</td>
<td>25</td>
<td>25</td>
<td>15</td>
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<tr>
<td>Manage pediatric critical care patients (critical care support)</td>
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<td>18</td>
<td>23</td>
<td>25</td>
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<tr>
<td>Pediatric critical care drug familiarity</td>
<td>7</td>
<td>8</td>
<td>9</td>
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<tr>
<td>Learn Ventilators</td>
<td>5</td>
<td>3</td>
<td>8</td>
<td>5</td>
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<tr>
<td>Familiarity with specific critical care topics: Respiratory failure, Sepsis, DKA, Ingestion, Trauma, Seizure, Head Injury</td>
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<td>8</td>
<td>5</td>
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<tr>
<td>Gain Comfort with Critically Ill Child</td>
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<td>2</td>
<td>1</td>
<td>5</td>
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<tr>
<td>Handle problems that may see in an ER</td>
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<td>2</td>
<td>3</td>
<td></td>
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<tr>
<td>Post op complications</td>
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<td>2</td>
<td>2</td>
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<td>Critical care physiology in children</td>
<td>1</td>
<td>3</td>
<td>1</td>
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<tr>
<td>Be able to discuss PICU sequelae with families in my practice</td>
<td></td>
<td>1</td>
<td></td>
<td>2</td>
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<tr>
<td>Deliver Bad News to families</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
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<tr>
<td>Learn Arrythmias</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
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<tr>
<td>Difficult airway</td>
<td>1</td>
<td></td>
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<td>Stabilize for Transport</td>
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<tr>
<td>Invasive cardiopulmonary monitoring</td>
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<td>2</td>
</tr>
<tr>
<td>Ventilator support for chronic vent dependent children</td>
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<tr>
<td>Familiarity with children with chronic medical issues</td>
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<td>1</td>
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<td>Organizational skills in PICU</td>
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<td>Determine if pediatric critical care a career possibility</td>
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## Participants

And

### Overall Evaluation of PICU

#### July 1998 – June 2002

<table>
<thead>
<tr>
<th>Residency Program</th>
<th>Number</th>
<th>Evaluation of PICU (Average Likert Score 4 best, 1 worse)</th>
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<tbody>
<tr>
<td>Thomas Jefferson Pediatrics PGY2</td>
<td>70</td>
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<td>Thomas Jefferson Emergency Medicine</td>
<td>45</td>
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<td>Christiana Care Health Center Emergency Medicine (includes Emergency Medicine/Internal Medicine)</td>
<td>56</td>
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<td>Christiana Care Health Center Medicine Pediatrics</td>
<td>16</td>
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<td>Alfred I duPont Emergency Medicine Fellow</td>
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<td>3</td>
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<tr>
<td>Medical Student</td>
<td>15</td>
<td>3.5</td>
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<tr>
<td>Pediatric Critical Nurse Practitioner</td>
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<tr>
<td>Visiting Emergency Medicine (St Lukes)</td>
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#### July 2001–June 2002

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<th>Number</th>
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</thead>
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<td>Thomas Jefferson Pediatrics PGY2</td>
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<td>3.33</td>
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<tr>
<td>Thomas Jefferson Emergency Medicine</td>
<td>12</td>
<td>2.83</td>
</tr>
<tr>
<td>Christiana Care Health Center Emergency Medicine (includes Emergency Medicine/Internal Medicine)</td>
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<td>2.75</td>
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<tr>
<td>Medical Student</td>
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<td>3.5</td>
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<tr>
<td>Pediatric Critical Nurse Practitioner</td>
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</tr>
<tr>
<td>Visiting Emergency Medicine (St Lukes)</td>
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</table>
## Resident Learning Preferences

**July 1998 – June 2002**

<table>
<thead>
<tr>
<th></th>
<th>Thomas Jefferson Pediatric Pediatrics n= 67</th>
<th>Thomas Jefferson Emergency Medicine n = 44</th>
<th>Christiana Care Health Center Emergency Medicine n = 50</th>
<th>Christiana Care Health Center Medicine Pediatrics n = 50</th>
<th>Medical Student n = 14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask attending questions</td>
<td>49 (73%)</td>
<td>34 (77%)</td>
<td>34 (68%)</td>
<td>12 (24%)</td>
<td>8 (57%)</td>
</tr>
<tr>
<td>Involvement in patient care</td>
<td>39 (58%)</td>
<td>32 (72%)</td>
<td>32 (64%)</td>
<td>13 (26%)</td>
<td>7 (50%)</td>
</tr>
<tr>
<td>Mock Code Drills</td>
<td>33 (49%)</td>
<td>27 (61%)</td>
<td>26 (52%)</td>
<td>7 (14%)</td>
<td>4 (29%)</td>
</tr>
<tr>
<td>Check Medical Texts for Info</td>
<td>32 (48%)</td>
<td>17 (39%)</td>
<td>20 (40%)</td>
<td>10 (20%)</td>
<td>3 (21%)</td>
</tr>
<tr>
<td>Participate in Unit Rounds</td>
<td>28 (42%)</td>
<td>27 (61%)</td>
<td>35 (70%)</td>
<td>12 (24%)</td>
<td>8 (57%)</td>
</tr>
<tr>
<td>Formal Lectures</td>
<td>27 (40%)</td>
<td>14 (32%)</td>
<td>17 (34%)</td>
<td>5 (10%)</td>
<td>4 (29%)</td>
</tr>
<tr>
<td>Do Medline Searches</td>
<td>24 (36%)</td>
<td>9 (20%)</td>
<td>9 (18%)</td>
<td>11(22%)</td>
<td>3 (21%)</td>
</tr>
<tr>
<td>Reading Program</td>
<td>19 (28%)</td>
<td>13 (30%)</td>
<td>9 (18%)</td>
<td>4 (8%)</td>
<td>5 (36%)</td>
</tr>
<tr>
<td>Give a Talk</td>
<td>17 (25%)</td>
<td>5 (11%)</td>
<td>9 (18%)</td>
<td>9 (18%)</td>
<td>1(7%)</td>
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</tbody>
</table>

It may be difficult to incorporate evidence based clinical practice which requires computer searches, ask residents to follow a reading program and prepare for a talk during interactive rounds. These activities are not high on ways residents prefer to learn.

Critical care physicians must try to individualize the PICU rotation for each resident.
Present Core curriculum for PICU Resident One-month Rotation

4 week block

Individualized Introduction to PICU, Day 1

Pre-test based on 5 pediatric critical care scenarios in order to sensitize resident to the PICU environment.

Personal books for each resident

Handbook of Pediatric Intensive Care (Rogers/Helfaer)
Manual of Pediatric Critical Care (Singh)
Case Studies in Pediatric Intensive Care (Rogers/Helfaer)
Handbook or Pediatric Mock Codes

PICU Texts

Pediatric Intensive Care, Third Edition
Mark C. Rogers

Pediatric Critical Care
Fuhrman/Zimmerman
2nd Edition

The Difficult Pediatric Airway
Anesthesiology Clinics of North America
Jalil Riazi, MD, Editor
1999

Pediatric Transport Medicine
Karen McCloskey / Richard Orr

Management of Pediatric Trauma
Buntain

Critical Heart Disease in Infants and Children
Nichols, Cameron, Greeley, Lappe, Ungerleider, Wetzel

Pediatric Cardiac Intensive Care
Chang, Hanley, Wernovsky, Wessel

Illustrated Textbook of Pediatric Emergency and Critical Care Procedures
Dieckmann, Fiser, Selbst

Supportive Care of Children with Cancer
Current Therapy and Guidelines from the Children's Cancer Group
Edited by Arthur R. Ablin MD

Textbook of Pediatric Emergency Medicine
Ludwig Fleisher

Toxicologic Emergencies
Lewis R. Goldfrank
Toxicology
Frojd/DeLaney/Ling Erickson

The Pharmacologic Approach to Critically Ill Patients
Chernow, Third Edition
Principles and Practice of Intensive Care Monitoring
Tobin

Nelson Textbook of Pediatrics
5th edition, 1996

Smith's Recognizable Patterns of Human Malformation
5th edition, 1997

Computer Access for
PICU Rotation

http://www.nemours.org/no/de/aidhc/picu

Username: depicu
Password: resident

- Overview
- Faculty
- Timeline
- Goals
- Curriculum 2001-2002
- Pre-rotation Questionnaire
- Administrative Issues
- Guide to Presenting PICU Patients on Rounds
- Difficult Airway Cart
- Pediatric Critical Care Medicine: Clinical Resources
- Pediatric Critical Care Medicine Evidence-Based Journal Club
- Pediatric Critical Care Medicine: Internet Resources
- PedsCCM (Pediatric Critical Care Medicine Web Site)
- Pediatric Critical Care Education
- Powerpoint Presentations
- Incorporating Evidence Based Clinical Practice into the PICU
• **PICU Internet Resources**
• **PubMed Search Engine**
• **Article Request - Delaware Academy of Medicine**
• **Evaluations**
• **Questions, Comments, Suggestions - Contact Us**

PICU Vividesk

Bringing to the PICU resources and the ability to evaluate these resources with evidence based clinical practice principles in order to optimize patient care. Nemours Education Innovation Project.

Reference Librarian participates in Friday morning patient care rounds and is available via email or phone during the week.

Self learning resources on computer resources

Link to Pediatric Critical Care Medicine web site
  PICU Book
  PICU Journal Club
  PICU Cases
  PICU Literature
  PICU Web Sites

Link to pedscourse.org
  Powerpoint presentations on basic critical care topics

Link to additional powerpoint presentations developed by our critical care physicians

Interactive teaching

Daily Rounds
  During Patient Care
  Supervision day / night

Mock Codes
  1100, each Monday
  (Also 1100, each Wednesday for CCHC pediatric 2A residents)

Interactive PICU Teaching Rounds with Critical Care Attending (other than physician on service)
  1100, each Friday

Multidisciplinary
  1100, 2nd Wednesday: Introduction to Ventilators (Respiratory Therapy)

Journal Club
  1230, 3rd or 4th Wednesday

SCCM Pediatric Residency Education Committee PICU Rotation Post-Test
Elective for Transport / Sedation / OR for Intubation available and is coordinated by James Hertzog MD and Kathy Bradford MD.

Pediatric Critical Care Nurse Practitioner Student rotation coordinated by Andrew Costarino MD.

Neonatologist like to meet with residents 1300 each Wednesday since PICU residents cross cover the SNICU for emergencies at night and weekends.

Monthly maintenance / Data Entry
   Menu Page organizing various data queries
   Reports
**PICU Resident Rotation**

**Monthly Maintenance Plans**

<table>
<thead>
<tr>
<th>Week</th>
<th>Things to do</th>
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**Monday**

Give beeper, meal tickets to new, visiting residents.
Show residents call room.
Assign locker and lock to resident
Put new PICU Core Curriculum on PICU work station desk

Get residents to Cerner, Novelle and Stentor training as needed.

Collect individual resident evaluation check off sheets from billing book
   Enter data into PICU resident data base.

Put Individual resident Check off sheets into Billing Book in PICU, copy for each critical care physician’s folder

Dr Cullen will orient residents after morning PICU rounds and return resident folders. Maintain these individual folders until all forms are returned and data entered in data base.

Remove resident/medical student names from the first section of queries of the Monthly Menu Page of PICU Resident data base.

Adjust dates on Monthly Menu Page of PICU Resident Data Base for previous month’s Lectures, Mock Codes, Interactive Rounds, Attending clinical teaching

**Tuesday, Wednesday, Thursday**

Collect
   Pre-rotation questionnaires and Pre-tests

Enter new resident data into data base
   Resident ID
   Prerotation Questionnaire
   PICU Profiles
   Pre-test

Continue to enter exiting resident data into resident data base
   PICU Evaluations
   Resident Evaluations
   SCCM Post Test
   Primary Patient Data

**Friday**

Give completed resident folder for exiting residents to Dr Cullen who will complete and send in Specific Program Resident Evaluation Forms

**Enter as they are done**

Mock Codes
Interactive PICU Teaching Rounds
Week 2

Monday
- Prepare curriculum for next month rotation
- Send next month’s curriculum to PICU Curriculum Distribution List

Tuesday
- Enter attending clinical teaching days for present rotation period in data base
- Enter lectures scheduled for this month rotation in data base

Enter as they are done
- Mock Codes
- Interactive PICU Teaching Rounds
Week
3

Things to do

Monday, Tuesday, Wednesday

**Prepare folder for new resident(s)**
- Assign ID number and write on folder
  - (follow present method: if start on 2/11/01 then ID is 02110101 for first person on that date, 02110102 for second person on that date, etc)
- Place Check Off sheet on cover
- Pre-rotation questionnaire
- PICU Pre-Test
- Copy of PICU Curriculum
- Primary patient / Procedure flow sheet
- PICU Resident Report form
- Evaluation of PICU form
- SCCM post test / answer sheet
  - Assign SCCM ID number and place on post-test answer sheet
  - Record SCCM ID number on master sheet
- Night call schedule
- Emergency medication card
- IV electrolyte replacement card
- RSV handout
- **Thomas Jefferson University Medical Library monthly guest username/password**
- PICU Vividesk username/password

Prepare Blue Book for new resident(s)

- Complete necessary paperwork for visiting residents and medical students and set up training dates for Cerner on day1 and Nouvell, Stentor for day 1 to 3 of rotation.

Thursday

- Put new resident/medical student names into the various querries of Monthly Menu Page of PICU Resident data base

**Enter as they are done**
- Mock Codes
- Interactive PICU Teaching Rounds
Week 4

Things to do

Monday

Hand out SCCM Post Test and PICU Evaluation forms to residents who will be leaving at the end of the week.

Remind them to hand these forms with their textbooks and Blue Book on Friday.

Friday

Collect beepers from departing visiting residents

Collect textbooks, Blue Book, post-rotation questionnaire and SCCM post test from residents.

Check off returned books on resident folder face sheet

Grade SCCM post-test

Enter scores onto Master Form

Enter data in resident data base

  PICU Evaluation Forms
  SCCM Post Test grades
  Primary patient data

Assign books to new residents

  Record book number ID onto resident file face sheet

Give new Resident Folders with assigned textbooks and Blue Book to Dr Cullen

Enter as they are done

  Mock Codes
  Interactive PICU Teaching Rounds
Additional PICU Resident Rotation Support

August, September, October

Prepare new yearly data for menu page and help place queries for the next year’s PICU resident data onto Menu Page

November

Prepare mailing list and survey for residents who have been in PICU and are now out in practice.

December

Mail surveys

January, February, March

Enter survey data into PICU resident data base

April, May, June

Assist in preparation of Review of PICU Resident Rotation and Preparation of Goals / Curriculum for next academic year
Average Self-Reported Comfort Levels of Residents with Critically ill Children and Critical Care Attendings Comfort Level with Residents to Recognize and Stabilize a Critically Ill Child at the Completion of Their PICU Rotation

10 = most comfortable; 1=least comfortable

<table>
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<tr>
<th>Year</th>
<th>TJU Pediatrics</th>
<th>TJU Emergency Medicine</th>
<th>CCHC Emergency Medicine</th>
<th>CCHC Medicine Pediatrics</th>
<th>Medical Students</th>
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<tbody>
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<td>1998-1999</td>
<td>Resident Comfort Pre-rotation</td>
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<td>3.83</td>
<td>4.36</td>
<td>6.00</td>
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<tr>
<td></td>
<td>Resident Comfort post-rotation</td>
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<td>7.77</td>
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<td>6.82</td>
<td>6.79</td>
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<td></td>
<td>Resident Comfort post-rotation</td>
<td>6.86</td>
<td>6.75</td>
<td>6.79</td>
<td>7.25</td>
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<td></td>
<td>Critical Care Attending Comfort with Residents post-rotation</td>
<td>7.06</td>
<td>6.42</td>
<td>6.88</td>
<td>7.00</td>
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<td>2001-2002</td>
<td>Resident Comfort Pre-rotation</td>
<td>4.13</td>
<td>4.50</td>
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<td>Resident Comfort post-rotation</td>
<td>6.44</td>
<td>7.20</td>
<td>7.67</td>
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<td>Critical Care Attending Comfort with Residents post-rotation</td>
<td>6.40</td>
<td>6.60</td>
<td>6.75</td>
<td>6.50</td>
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</table>
Self-reported Comfort Level for Recognizing and Stabilizing a Critically Ill Child for Previous PICU Residents Now in Practice < 1 Year

10 = most comfortable; 1=least comfortable

<table>
<thead>
<tr>
<th>Comfort Level</th>
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<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>Residency Program</td>
</tr>
<tr>
<td>Thomas Jefferson Pediatrics PGY2  n=49</td>
</tr>
<tr>
<td>Thomas Jefferson Emergency Medicine  n=34</td>
</tr>
<tr>
<td>Christiana Care Health Center Emergency Medicine  n=22</td>
</tr>
<tr>
<td>Christiana Care Health Center Medicine Pediatrics  n=4</td>
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</table>
SCCM Pediatric Residency Education Committee PICU Rotation Multiple Choice Post-Test

Percentage correct answers (Average)

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<tr>
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<tbody>
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<td>ResidencyProgram</td>
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<tr>
<td>Thomas Jefferson Pediatrics</td>
<td>71%</td>
<td>74%</td>
<td>73%</td>
<td>64%</td>
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<tr>
<td>Thomas Jefferson Emergency Medicine</td>
<td>71%</td>
<td>72%</td>
<td>72%</td>
<td>67%</td>
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<tr>
<td>Christiana Care Health Center</td>
<td>66%</td>
<td>76%</td>
<td>82%</td>
<td>66%</td>
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<tr>
<td>Emergency Medicine Pediatrics</td>
<td></td>
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<tr>
<td>Christiana Care Health Center</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Medicine Pediatrics</td>
<td>78%</td>
<td>76%</td>
<td>76%</td>
<td>63%</td>
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<tr>
<td>Medical Students</td>
<td>71%</td>
<td>58%</td>
<td>66%</td>
<td>62%</td>
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</table>
Financial Sources for Resident Teaching

Physicians

Nemours

Nemours Foundation provides yearly funds to Nemours practice site CEOs and department chairpersons to distribute to Nemours physicians for all education activity. It is not known how much is actually available for PICU resident education.

Graduate Medical Education

Centers for Medicare and Medicaid Services, Health Resources and Services Administration, Children’s Hospitals Graduate Education Payment Program

Alfred I duPont Hospital for Children received $2,772,606 GME funds for FFY 2001 for 54 pediatric residents. The Direct Medical Education allotment for salaries for PICU physicians to teach PICU residents was $ - 33,622.

Alfred I duPont Hospital for Children receives no GME for residents rotating from non-pediatric programs.

Multidisciplinary Team

PICU Pharmacists, PICU Nursing and Nursing Staff Development, PICU Respiratory Therapists and Reference Librarian, Neonatologists are supported by their respective departments for PICU resident teaching.

Educational Materials

Books, CD ROM, Computers, AudioVisual
Cost picked up by Department of Anesthesiology & Critical Care as funds available
Critical Care Time Physician
PICU Resident Education, Clinical, Research and Administrative Commitments

1 Full Time Equivalent (FTE) Nemours pediatric critical care physician is expected to provide 2080 hours of service per year and produce 4000 Relative Value Units (RVU).

Presently, 7% of hours (146 hours) are expected to be devoted to education.

The only way at present to produce RVU is by clinical activity.

Pediatric critical care physician educational activities include but are not limited to:

- PICU Resident Education
- Alfred I duPont ER Fellowship Program
- International, National, Regional PICU and Critical Care Educational Committees
- Lectures to Referring Physician Groups, Nurses, Respiratory Therapy, EMS Groups
- Grand Rounds
- Critical Care Attendings Group Educational Activities (Journal Clubs, Presentations to Department)
- Instructor for PALS
- HFOV Course
- Soon, Pediatric Critical Care Fellowship Program

We arbitrarily designate 50% of education time for PICU resident rotation, that is 72 hrs / yr / 1 FTE or 6 hrs / 4 week PICU rotation block / 1 FTE.

An average FTE pediatric critical care physician at Alfred I dupont Hospital for Children spends the following hours in hospital:

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<tbody>
<tr>
<td>Clinical Activity 7AM-7PM</td>
<td>1143</td>
<td>1281</td>
<td>1536</td>
<td>1773</td>
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<tr>
<td>Clinical Activity 7PM-7AM</td>
<td>925</td>
<td>875</td>
<td>1097</td>
<td>958</td>
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<tr>
<td>Education, Research, Administrative and Keep up with Literature activity 7AM-7PM</td>
<td>1165</td>
<td>975</td>
<td>624</td>
<td>537</td>
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<tr>
<td>Total</td>
<td>3233</td>
<td>3131</td>
<td>3257</td>
<td>3296</td>
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Time (Hours) given to PICU Resident Educational Activity, July 2001- June 2002

<table>
<thead>
<tr>
<th></th>
<th>Admin</th>
<th>Intro</th>
<th>Mock Code AIDI PICU and Christiana</th>
<th>PICU Interactive Rounds AIDI PICU</th>
<th>Patient Clinical Rounds Teaching AIDI PICU</th>
<th>Journal Club</th>
<th>Day interactive teaching, supervision AIDI PICU</th>
<th>Nighttime interactive teaching, supervision AIDI PICU</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>1 FTE</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>85</td>
<td>74</td>
<td>271</td>
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<tr>
<td>1 FTE</td>
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<td></td>
<td>80</td>
<td>84</td>
<td>284</td>
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<tr>
<td>1 FTE</td>
<td>230</td>
<td>24</td>
<td>26</td>
<td>13</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>533</td>
<td></td>
</tr>
<tr>
<td>1 FTE</td>
<td>6</td>
<td>3</td>
<td>17</td>
<td></td>
<td></td>
<td>17</td>
<td>22</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>0.5 FTE</td>
<td>9</td>
<td>4</td>
<td>57</td>
<td></td>
<td></td>
<td>57</td>
<td>42</td>
<td>169</td>
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<tr>
<td>0.5 FTE</td>
<td>3</td>
<td>9</td>
<td>23</td>
<td></td>
<td></td>
<td>23</td>
<td>40</td>
<td>98</td>
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<tr>
<td>0.25 FTE</td>
<td>3</td>
<td>6</td>
<td>23</td>
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<td></td>
<td>23</td>
<td>23</td>
<td>78</td>
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<td>11</td>
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<td>1509</td>
</tr>
</tbody>
</table>

Physician FTEs at present spends more time in PICU resident rotation educational activity than expected in all other Nemours’ educational activity.

If there is an increase in physician FTE activity in PICU resident educational activity, more time will have to be spent in the hospital if maintain present clinical, administrative and research projects. Alternatively, If there is an increase in physician FTE activity in PICU resident educational activity but keep total hospital hours the same, then less time will be available for administrative, research or other educational activities.

Including Clinical Rounds plus Interactive Supervision during the day and night as educational hours can be challenged.

We have also underestimated the hours spent by individual physicians in interactive resident teaching.

Critical care physicians need time to keep up with the latest pediatric critical care issues in order to maximize their teaching interactions with residents as well as patient care.

Expecting changes in FTEs that may overall keep the present FTE total.
Individual Resident Time
in
PICU
(4 week Rotation)

Average Hours the Individual Resident Spends in the PICU

261 hours
151 daytime hours (58% of rotation hours)
110 night time hours (42% of rotation hours)

Daytime
Monday to Friday Day 135 hours (52% of daytime hours)
Saturday Day 8 hours (3% of daytime hours)
Sunday Day 8 hours (3% of daytime hours)
Total 151 hours (58%)

Nighttime
Monday to Friday Night 76 hours (29% of night time hours)
Saturday Night 19 hours (7% of night time hours)
Sunday Night 15 hours (6% of night time hours)
Total 110 hours (42%)

Breakdown of hours

28 day block PICU resident rotation
Total available hours = 672 hours

Break Down of Individual Resident Hours in PICU
Daytime (151 hours)
11 weekdays
7AM – 4PM
9 hours x 11 = 99 hours

5 weekday mornings post call
7AM -11 AM
4 hours x 5 = 20 hours

4 weekdays where resident has to go to clinic or ER Conference
4 hours x 4 = 16 hours

TJU Peds and CCHC MedPeds,
½ day Continuity Clinic
4 hours AM or PM each day

TJU and CCHC residents
½ day ER Conference for
4 hours AM each day
CCHC IM-ER residents have both ER Conference and continuity clinic
½ day for continuity clinic
4 hours AM or PM each day
½ day ER conference
4 hours AM each day

1 Saturday Day = 8 hours
8AM – 4PM

1 Sunday Day = 8 hours
8AM – 4P

Night = 110 hours

4 Night call
4PM weekday– 7AM next weekday
15 hours x 4 = 60 hours

1 Night call
4PM Fri – 8AM Sat
16 hours x 1 = 16 hours

1 Saturday Night = 19 hours
4PM Sat – 11AM Sun

1 Sunday Night = 15 hours
4PM Sun - 7AM Mon

The optimal times for all residents to meet as a group are Monday, Wednesday and Friday at 1100 (if the person on the previous night can stay awake).

Making changes to the PICU rotation that asks residents to increase their academic effort, such as presenting at Interactive Rounds needs to take into account:

PICU Residents have responsibilities for patient care and computer order entry. They also must keep up with their individual program request for seminar talks, journal clubs and resident non-PICU projects.

There is no scheduled time during the day where each resident can concentrate on studying.

PICU residents must also get sleep during their 28-30 hour call day.

PICU residents must also have personnel time and time to meet family commitments.
Residents’ Suggestions
For
Improving PICU Resident Rotation
at
Alfred I duPont Hospital for Children

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<tbody>
<tr>
<td>More procedures</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>5</td>
<td>26</td>
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<tr>
<td>More Mock Codes</td>
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<td>4</td>
<td>5</td>
<td>6</td>
<td>23</td>
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<td>2</td>
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<td>Residents shouldn’t have to enter orders in computer</td>
<td>3</td>
<td>6</td>
<td>4</td>
<td>1</td>
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<tr>
<td>Give residents more autonomy</td>
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<tr>
<td>More interactive case presentations</td>
<td>3</td>
<td>2</td>
<td>6</td>
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<tr>
<td>Need Anesthesia experience (intubation)</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>10</td>
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<tr>
<td>Allow fellows to run rounds and Supervise residents</td>
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<tr>
<td>Nurses speak with residents first</td>
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<td>3</td>
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<td>Include residents more in decision making</td>
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<td>More bedside teaching rounds</td>
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<td>1</td>
<td>4</td>
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<td>More teaching on rounds</td>
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<td>More acute vs chronic and post op patients</td>
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<td>3</td>
<td>3</td>
<td>2</td>
<td>6</td>
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<td>More PICU, Less NICU Time</td>
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<td>PICU 6-8 vs 4 weeks</td>
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<td>2</td>
<td>3</td>
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<td>More Ventilator Experience</td>
<td></td>
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<tr>
<td>Handout for Specific critical care issues in our PICU</td>
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<tr>
<td>Keep rounds short</td>
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<td>Allow residents to participate in codes</td>
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<tr>
<td>Attendings instead of respiratory therapist to give ventilator lecture</td>
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<tr>
<td>More patients</td>
<td>1</td>
<td></td>
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<tr>
<td>Limit rotation to 4 residents</td>
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<tr>
<td>Find a teaching point for every patient (acute and chronic) encounter</td>
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<tr>
<td>Same attending for 1 week</td>
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<tr>
<td>Excuse residents from non-PICU activities</td>
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<tr>
<td>At night, have a senior and junior level resident in PICU</td>
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<tr>
<td>Provide chapter, pages for recommended readings</td>
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<td>---------------------------------------------------------------------------</td>
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<tr>
<td>Call room beeper medical students</td>
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<td>Don’t put off service residents on call during mandatory residency activities</td>
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<tr>
<td>More experience with initial management of life threatening illness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
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<tr>
<td>Evaluate patients on ward for appropriate ICU transfer</td>
<td></td>
<td></td>
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<td></td>
<td>1</td>
</tr>
<tr>
<td>Handle emergency equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>What to do on Transport</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Office based interventions for critically ill child</td>
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<td></td>
<td>4</td>
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<tr>
<td>Trauma exposure</td>
<td></td>
<td></td>
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<td>2</td>
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<tr>
<td>Invite Chief Resident into PICU</td>
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<td>1</td>
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<tr>
<td>More hands on patient management</td>
<td></td>
<td></td>
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<td>1</td>
</tr>
<tr>
<td>Review Surgical Airway</td>
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</tr>
<tr>
<td>Procedure lab</td>
<td></td>
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<tr>
<td>Discuss critical care issues one would see in an ER</td>
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<td>2</td>
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<td>Pediatric sedation</td>
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<td>Communication skills with families</td>
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<td>More EKG interpretations</td>
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Pediatric Critical Care Attendings’ Suggestions for Improving PICU Resident Rotation

Resident Educational Experience during PICU rotation

Procedure Lab
Yes, would be great
To OR for intubations
PediSiman Manequin may be ok for airway but not chest tubes.

Schedule Animal Lab one day during their rotation
One group in AM
One group in PM

Would need funds, IRB input, technicians who run animal lab consistently.

From surveys, pediatric residents rarely do procedures. Is it worth the effort and money? From surveys, ER residents do pediatric procedures but not a lot unless they are at large centers. It is unreasonable to think they will get all their pediatric procedural needs met on a one month PICU rotation.

PediSiman Manequin

Computer based case scenarios
ARDS
Septic Shock
CRRT
Etc

Yes, excellent idea
Can be used for Mock Codes also
Can also be used for Interactive Teaching Sessions

Computer ordering system geared to minimize Resident time at computer
Yes, a priority.

Individualized the PICU experience with one attending assigned to one resident for the month in addition to the present overall format.
Yes x 3

Mentor. Interact with resident every day or every few days, direct and ask questions.

The Mentor would also do the formalized exit interview (they would have input from other attendings through the present eval forms process)
Could be tough from time standpoint

Use our conjoint analysis tool to find out what the ideal rotation would be for each residents and mentor can try to optimize.

**Formalized exit interviews**

Speak about residents as a group. Gather comments for evaluation form.

Need to do

Individualized mentors may facilitate

**Mechanical Vent Lab**

Includes present respiratory therapy overview of ventilators

Yes

**Formal lectures 1100 on Wednesdays by PICU attendings**

1<sup>st</sup> Wed

EBCP Practical Overview for PICU

2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> Wed

Combine Critical Care physician lecture with residents’ CAT on a PICU problem related to topic. Critical care attendings would develop focused clinical question for their lecture and residents will do a CAT to be discussed as part of the lecture.

ARDS

Sepsis

Neurocranial intensive care

Yes

Consider using video display monitor for PICU lectures

Don’t forget that we will be doing structured lectures for fellows when PICU Fellowship begins.

**Nemours PICU Resident Handbook**

12 hour PICU shifts for residents on rotation

Ask Librarian to attend more PICU rounds and help search something on rounds.

**Shamin Tejani, PICU Clinical Pharmacist formal lecture**

Promoting EBCP principles into PICU routine- encouraging residents (as well as nurses and RTs) during rounds to ask focused clinical questions about PICU problems; find literature; evaluate the validity, results and applicability to patients and then report back to group.

**Journal Club**

Converting to Research issues
Expansion of PICU Resident Educational Experience outside PICU rotation

Morning Report at AIDI (3rd year report)

If any critical care doc is available, they should make an effort to go.

Back up person or 3rd person. Not everyone all the time.

PICU case to be presented by a PICU resident one or two designated days a month (alternating Tues or Thurs) at 0830. On this day, break from rounds and go as group. As many critical care docs as possible go to report. PICU residents will have to pick case a few days before and tell Ed who will then email critical care attendings with info. The critical care doc on service can stay in PICU if need be for patient care.

Noon Conference at Pediatric Residency Program, Alfred I duPont Hospital for Children

Consider every 4th Wed (this would replace a Mock Code at Christiana). Joan Culver would coordinate dates/topics.

Intern Report at AIDI (Interns learn to give report; Interns pick cases and go over differentials)

No

Monthly PICU Case Conference at AIDI

No

Mock Codes outside PICU

For AIDI: No (Discussion underway for Chief Residents, ER Fellows, ER physicians to do some)

It is an advantage to other attendings (not PICU) to do Mock Codes so they are comfortable.

For Christiana: Ask MedPeds Chief Resident to do 2 of the present 4 Mock Codes/month at Christiana. We do one a month? The other Wed we are giving noon conference at AIDI

1st year rotation in PICU

A goal but short on residents at present.

No x 2

3rd year rotation in PICU

On back burner in residency office.

No

Do all PALS course for incoming pediatric residents

Yes x 2

As a whole group together, No. But individual critical care attendings should consider if time permits.
PR, Explaining what we already do in resident teaching

How do our Pediatric residents compare to all residents as regards the critical care board questions on the Pediatric Boards?

Is same info available for ER residents?

Use PICU Resident Rotation Internet site to have interactive case conferences with a forum-like discussion on-line over several days.

No. Residents have limited computer access at presnet. Time involved.

Case Conference at TJU

No. (There is an ER/Pediatric case conference once a month at present. Dr Selbst attends)

“political issues” No PICU at TJU

Elective for 3rd year-combined PICU/Transport and Anesthesia

Jim and Kathy preparing an elective with Transport/Sedation/Anesthesia (in OR for intubations)

Consider each resident doing a week of Transport/Sedation/Anesthesia as part of their PICU rotation?

Besides our general monthly format, individual critical care attendings can do any educational activity they deem important. I will keep record in resident data base so they get credit.

Yes

Bottom line

Go to morning report, noon conference, more mock codes, PALS, expand PICU educational activity.

Don’t lose sight of PICU rotation as the key element

No new time, just redirected activity. If there are more critical care physicians, can do more educational activities

Same time commitment but spread out so more exposure across hospital

Priorities: Morning report (scheduled to show up), Intern Report (special presence), Noon lectures (canned lectures), Intern Education Day in preparation for PICU year (Mock Codes, Procedures, Vent Lab, Cases), Nemours Handbook

Modify present educational activity in order to give more bang for the buck
Suggested PICU Resident Rotation
Core Curriculum for
July 2002-June 2003

4 week block

Formal
Individualized Introduction to PICU,
Monday 1 (Cullen)

Pre-test
PICU Vividesk Introduction / EBCP introduction for PICU Interactive Lectures
1100, Wed 1 (Cullen)

Mock Code AIDI, 1100 Monday 2,3,4
Mock Code AID, 1100 Friday 1

Mock Code CCHC, 1100 Wed 2

PICU Interactive Lecture – ARDS
(includes EBCP prep by residents for a pre-determined focused clinical question)
1100, Friday 2

PICU Interactive Lecture – Sepsis
(includes EBCP prep by residents for a pre-determined focused clinical question)
1100, Friday 3

“Journal Club” / Research Meeting,
1230, Wed 4

PICU Resident Case Report at Residency Morning Report
0830, Tues 2 and Thurs 3
Residents pick among themselves who will present and which patient to present.

The presenting resident needs to let Judi Hudson at extension 5390 who the patient is to be presented. Judi will email critical care physicians with the patient name. Physicians who wish to participate during the case report can review the patient clinical course.

It is at the discretion of the attending on service in the PICU to either let the individual resident present or go as a group for the ½ hour morning report. The on-service attending can request that the back up critical care attending monitor the unit if necessary.

Critical care physicians who attend can email DR Cullen that they attended and this will be added to resident rotation data base.
Introduction to Ventilators (Respiratory Therapists)  
1100, Wed 2

Pharmacologist’s Perspective on Transplant  
1100, Wed 3

Personal books

Handbook of Pediatric Intensive Care (Rogers/Helfaer)  
Manual of Pediatric Critical Care (Singh)  
Case Studies in Pediatric Intensive Care (Rogers/Helfaer)  
Mock Codes

+ User’s Guides To The Medical Literature, Essentials of Evidence Based Clinical Practice.

PICU Texts

Pediatric Intensive Care, Third Edition  
Mark C. Rogers

Pediatric Critical Care  
Fuhrman/Zimmerman  
2nd Edition

The Difficult Pediatric Airway  
Anesthesiology Clinics of North America  
Jalil Riazi, MD, Editor  
1999

Pediatric Transport Medicine  
Karen McCloskey / Richard Orr

Management of Pediatric Trauma  
Buntain

Critical Heart Disease in Infants and Children  
Nichols, Cameron, Greeley, Lappe, Ungerleider, Wetzel

Pediatric Cardiac Intensive Care  
Chang, Hanley, Wernovsky, Wessel

Illustrated Textbook of Pediatric Emergency and Critical Care Procedures  
Dieckmann, Fiser, Selbst

Supportive Care of Children with Cancer  
Current Therapy and Guidelines from the Children's Cancer Group  
Edited by Arthur R. Ablin MD

Textbook of Pediatric Emergency Medicine  
Ludwig Fleisher

Toxicologic Emergencies  
Lewis R. Goldfrank
Toxicology
Frdth/Delaney/Ling Erickson

The Pharmacologic Approach to Critically Ill Patients
Chernow, Third Edition
Principles and Practice of Intensive Care Monitoring
Tobin

Nelson Textbook of Pediatrics
5th edition, 1996

Smith's Recognizable Patterns of Human Malformation
5th edition, 1997

Computer Access for

PICU Rotation
Description of PICU resident rotation and links to educational material
http://www.nemours.org/no/de/aidhc/picu

Username: depicu
Password: resident

PICU Vividesk
Bringing to the PICU resources and the ability to evaluate these resources with
evidence based clinical practice principles in order to optimize patient care.
Nemours Education Innovation Project

Self learning resources using computer resources

Link to Pediatric Critical Care Medicine web site
PICU Book
PICU Journal Club
PICU Cases
PICU Literature
PICU Web Sites

Link to pedscourse.org
Powerpoint presentations on basic critical care topics

Link to additional powerpoint presentations developed by our critical care physicians

Interactive teaching

Daily Rounds
During Patient Care
Supervision day / night

Individual Critical Care Mentor for each Resident
Meets briefly with resident weekly to touch base on needs.
Meets at end of PICU rotation (last Thurs or Fri)
Reviews the critical care evaluations that have been documented

If an individual critical care physician wishes to do additional lectures or interactive sessions, such as participating in the Pediatric Residency Noon Lecture series, they can contact Dr Cullen with the session’s content and this will be added to PICU resident education database.

On-line test, SCCM Pediatric Resident Committee. Planned start date is 1 July 2002
Tests based on 20+ powerpoint presentations from SCCM Pediatric Resident Committee web site that is available to residents.

Monthly maintenance / Data Entry (Cullen)
Menu Page organizing various data queries
Reports

Elective for Transport / Sedation / OR for Intubation available and is coordinated by James Hertzog MD and Kathy Bradford MD.

Pediatric Critical Care Nurse Practitioner Student rotation coordinated by Andrew Costarino MD.

Pediatric Critical Care Fellowship and Pediatric ER Fellow PICU rotation will be coordinated by Scott Penfil MD

Neonatologist like to meet with residents 1300 each Wednesday since PICU residents cross cover the SNICU for emergencies at night and weekends.
Challenges

Do Residents Who Come Through Our PICU Need the PICU Experience for Their Future Practice Settings?

How Do We Know That the Information We are Teaching Is Correct and Updated?

How do we Best Present Information & Skills to Residents During a PICU Rotation?

How Do We Evaluate Short Term and Long Term if the PICU Rotation Provides Residents With the Skills to Recognize and Stabilize a Critically Ill Child or Adolescent?

How do we make PICU Resident Rotation Data available to critical care physicians in real time?

How do we optimize patient safety and patient quality of care while providing PICU residents with sense of autonomy?

How do we finance an educational system that meets our goals?